Operating instructions

MT-xx7 Series

Panel PC MT-4x7
Remote HMI Thin Client MT-5x7
Remote HMI KVM MT-6x7

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1 Preface

These Operating Instructions contain all aspects relevant to explosion protection for the MT-xx7 operator interfaces (Panel PC and Remote HMI series). They also contain information on the connection and installation of these devices. Please also refer to additional documentation included in the delivery, such as the EC type examination certificate and the hardware manual, which contain further important information.

⚠ For the correct operation of all associated components please note, in addition to these operating instructions, all other operating instructions enclosed in this delivery as well as the operating instructions of the additional equipment to be connected.

⚠ Please also note that all certificates for the operator interfaces are included in a separate document.

1.1 General Notes

Please read the entire operating instructions before assembling the product.
In case of doubt the German original shall apply. We assume no liability for any typographical errors in these operating instructions.

In case of questions or suggestions, please don't hesitate to contact R. STAHL HMI Systems GmbH.

1.2 Technical progress

Alterations require the written consent of R. STAHL HMI Systems GmbH. The manufacturer reserves the right to adjust technical data to be in line with technical progress without any specific announcements.

2 Device function

The MT-xx7 operator interfaces are explosion-protected equipment for installation in hazardous areas and can be operated in zones 2 and 22 with interfaces for zones 0/1/2 and 20/21/22.
The devices are connected to a communication system via the serial interfaces (RS-232, Ethernet) located in their connection box at the rear. The connection box also contains the USB interfaces for the connection of various peripheral devices. Furthermore, the interfaces for keyboard, mouse, video and audio signals are also located here.

2.1 Panel PC MT-4x7

The MT-4x7 operator interfaces are intelligent display and operating devices which can run any software and are thus easy to operate.
The devices are fitted with powerful processors and are thus able to process even large applications on-site. The devices have a back-up and recovery system which can be used to save complete images and load them onto new Panel PCs without requiring specific IT skills. The X13 interface is provided for this purpose.

2.2 Remote HMI Thin Client MT-5x7

The Remote HMIs of the MT-5x7 series can be integrated into modern networks as Thin Clients or with a KVM box via KVM-over-IP. Digital Ethernet technology is used for the data transfer between KVM box and Remote System.
Up to four Remote HMIs can access one KVM box with one software license, thus cost-effectively communicating with several PCs - for example, when monitoring the production process and simultaneously applying Condition Monitoring.
Multi-monitoring with several on-site terminals can as easily be implemented as the application as Thin Client in a server environment with virtual work stations.

2.3 Remote HMI KVM MT-6x7

The KVM Classic transfer technology is used for the point-to-point connection between a PC and an MT-6x7 Remote HMI terminal.
There are two versions (DVI1 and DVI2) of this transfer technology that have slightly different functionality.

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3 Technical Data

Function / Equipment	**MT-457 MT-557 MT-657**	**MT-467 MT-567 MT-667**	**MT-477 MT-577 MT-677**	**MT-487 MT-587 MT-687**
Display type	TFT Color display 16.7 million colours			
Display size	48 cm (19")	56 cm (22")	61 cm (24")	61 cm (24"WU)
Resolution in pixels	SXGA 1280 x 1024	WSXGA+ 1680 x 1050	Full HD 1920 x 1080	WUXGA 1920 x 1200
Format	5:4	16:10	16:9	16:10
Display	Glass			
Touch Screen (optional)	Membrane or glass surface 5-wire analogue resistive			
Backlight	LED background lighting			
Service life (MTBF) of backlight at 20°C	typically 50,000 h			
Brightness	350 cd/m²	250 cd/m²	300 cd/m²	
Contrast	1000 : 1			
Additional keyboard (optional)	107 keys with integrated trackball / joystick / mouse pad or touch pad			
Power supply	Directly in the integrated connection box			
Connections	via control spring terminals, green flexible cable up to 2.5 mm² (AWG 16) fixed cable up to 4 mm² (AWG 14)			
Voltage supply	24 VDC or 100 - 240 VAC, 50 - 60 Hz			
Power consumption [A]	at 24 VDC = max. 3 A at 100 - 240 VAC = max. 1 A			
Power	typically 35 W / max. 150 W (typically 119 BTU / max. 510 BTU)			
Recommended fuses	5 AT			
Max. operating voltage Um	250 VAC			
only for MT-4x7 and MT-5x7 Real-time clock Data buffer Battery Capacitor	 Yes Lithium battery and capacitor buffered, maintenance-free > 5 years at least 4 days			
Interfaces				
Ethernet	Either Tx or Fx			
Copper (Tx)	10/100BaseTx, 10/100 Mbit (Ex-nA) only for MT-6x7 direct connection Gigabit			
Optical fibre (Fx)	100BaseFx, 100 Mbit, intrinsically safe (Ex op is) only for MT-6x7 direct connection			
Cable type Optical fibre MM Optical fibre SM	 Multi-mode optical fibre cable (50 µm core cross section and 125 µm external cross section) Single-mode optical fibre cable (9 µm core cross section and 125 µm external cross section)			
USB	2x Ex-ia; 1x Ex-nA			
USB	For keyboard and mouse (Ex-ia)			
Serial	RS-232, (Ex-nA)			
Video	FBAS (Ex-nA)			
Audio	Line In/Out interface (Ex-nA)			
Data cable lengths				
Optical fibre MM	up to 500 m (1,640 ft) via 50/125 µm optical fibre cable, up to 300 m (985 ft) via 62.5/125 µm optical fibre cable			
Optical fibre SM	up to 10,000 m (33,000 ft) via 9/125 µm optical fibre cable			
Copper (Tx)	up to 100 m (330 ft) via CAT7 installation cable AWG 22			
for DVI1 CAT	up to 140 m (460 ft) via CAT7 installation cable AWG 22			
for DVI2 CAT	up to 500 m (1,640 ft) via CAT7 installation cable AWG 22			
Enclosure	Stahl			
Enclosure protection type	IP66			

Permitted ambient temperature range	- 30°C … + 60°C
Operating temperature range	
Cold start temperature	- 10°C … + 50°C
Operation	- 20°C … + 60°C
Permanent operation	- 20°C … + 50°C
Operation with heater *	- 30°C … + 50°C
Short-term operation	- 30°C … + 60°C for a maximum of 5 h
Storage temperature range	- 30°C … + 70°C
Operating temperature range for DVI1	
Cold start temperature	+ 5°C … + 40°C
Operation	+ 5°C … + 40°C
Permanent operation	+ 5°C … + 40°C
Operation with heater *	+ 5°C … + 40°C
Storage temperature range	- 20°C … + 70°C
* Comment	The heater used must be of such a design that the temperature inside the operator interface's housing does not fall below -20°C (-30°C only at the front)!
Heat dissipation	about 40% via the front plate and 60% via the enclosure
Relative humidity	10 to 90% at +40°C, non-condensing
for DVI1	20 to 80% at 40°C, non-condensing
Dimensions [mm] (inch)	
Front (w x h)	660 x 475 (25.98” x 18.70”)
Cut-out (w x h) (+/- 0.5) (0.002")	615 x 435 (24.21” x 17.13”)
Depth of cut-out	110 (4.33")
Wall thickness	≤ 5 (0.02")
Mounting position:	vertical or horizontal
Weight [kg] (lb)	
Operator interface	16.00 (35.3 lb)

4 Conformity to standards

The MT-xx7 operator interfaces comply with the following standards and directives:

Standard	**Classification**
directive 94/9 EC	
Initial certification	
EN 60079-0 : 2009	General requirements
EN 60079-11 : 2007	Intrinsic safety "i"
EN 60079-15 : 2010	Type of protection "n"
EN 60079-28 : 2007	Optical radiation
EN 60079-31 : 2009	Protected by enclosures "tD" (dust)
EN 61241-11 : 2006	
Electromagnetic compatibility	
directive 2004/108 EC	
EN 61000-6-2 : 2006	Interference resistance
EN 61000-6-4 : 2007	Interference emission
Low voltage directive	
directive 2006/95 EC	
EN 50178 1997 :	Fitting power plants with electronic equipment
EN 61010-1 : 2001+	General requirements

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5 Certificates

The MT-xx7 operator interfaces are certified for installation in the following areas:
according to ATEX Directive 94/9/EC
for installation in zones 2 and 22

5.1 ATEX

The ATEX certificates are listed under the following certification numbers:

Certificate number for MT-xx7: BVS 12 ATEX E 033 X

6 Marking

Manufacturer	R. STAHL HMI Systems GmbH	
Type code	MT-xx7	
CE classification:	CE 0158	
Testing authority and certificate number:	BVS 12 ATEX E 033 X	
Ex classification:		
ATEX guideline 94/9/EC		II 3(1) G Ex nA nR [ia op is Ga] IIC T4 Gc II 3(1) D Ex tc IIIC [ia op is Da] IP66 T110°C Dc

7 Power supply

7.1 Operator interfaces

Power supply:	24 VDC or 100 – 240 VAC, 50 – 60 Hz	
Power consumption:	at 24 VDC	max. 3 A
	at 100 - 240 VAC	max. 1 A

8 Permitted maximum values

8.1 External, non-intrinsically safe circuits

Input voltage "PWR" (X10):

Nominal voltage:	20 ...240 V AC/DC (depending on type)
Power consumption I_{max}	≤ 5 A
Power P_{max}	≤ 150 W
Max. operating voltage U_m	≤ 250 VAC
Short-circuit current I_K	≤ 1500 A

USB (X13):

Rated voltage	5 VDC (± 10%)
Max. operating voltage U_m	≤ 250 VAC

12 V (X14):

Rated voltage	12 VDC (± 10%)
Power consumption Imax	≤ 400 mA
Max. operating voltage U_m	≤ 250 VAC

RS-232 "SER" (X97):

Rated voltage	15 VDC (± 10%)
Max. operating voltage U_m	≤ 250 VAC

Video "CAM" (X101):

Rated voltage	5 VDC (± 10%)
Max. operating voltage U_m	≤ 250 VAC

Audio "AUD" (X105):

Rated voltage	100 VDC (±10%)
Max. operating voltage U_m	≤ 250 VAC

Copper Ethernet (CAT7 1) (X16):

Rated voltage	5 VDC (± 10%)
Max. operating voltage U_m	≤ 250 VAC

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8.2 External inherently safe optical interface

Ethernet optical fiber (FO 1) (X18)
Multi-mode

Wavelength	850 nm
Radiant power	0.22 mW
max. radiant power:	35 mW

Single mode

Wavelength	1310 nm
Radiant power	0.22 mW
max. radiant power:	35 mW

8.3 External intrinsically safe circuits

Keyboard (X11)

The maximum values are:

U_i	=	5.5	C		U_o	=	5.5	C
I_i	=	3	A		I_o	=	309	mA
P_i	=	2	W		P_o	=	629	mW
C_i	=	negligible	µF		C_o	=	50	µF
L_i	=	negligible	mH		L_o	=	40	µH

Pointer device (X12):

The maximum values are:

U_i	=	5.5	C		U_o	=	5.5	C
I_i	=	3	A		I_o	=	309	mA
P_i	=	2	W		P_o	=	629	mW
C_i	=	negligible	µF		C_o	=	50	µF
L_i	=	negligible	mH		L_o	=	40	µH

USB1i (X24):

The maximum values are:

U_i	=	5.5	C		U_o	=	5.5	C
I_i	=	3	A		I_o	=	309	mA
P_i	=	2	W		P_o	=	629	mW
C_i	=	negligible	µF		C_o	=	50	µF
L_i	=	negligible	mH		L_o	=	40	µH

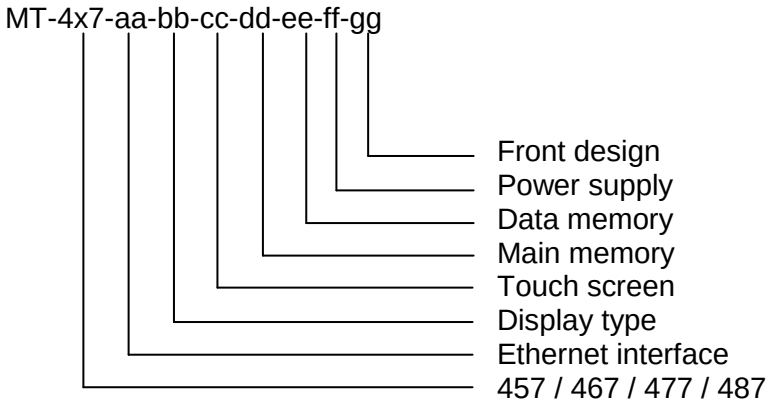
USB2i (X25):

The maximum values are:

U_i	=	5.5	C		U_o	=	5.5	C
I_i	=	3	A		I_o	=	309	mA
P_i	=	2	W		P_o	=	629	mW
C_i	=	negligible	µF		C_o	=	50	µF
L_i	=	negligible	mH		L_o	=	40	µH

9 Type code

9.1 Panel PC MT-4x7



Product type:

Product key structure	Description
	Type with
MT-4x7-**FX-MM**-bb-cc-dd-ee-ff-gg	Optical fiber Ethernet interface100BaseFx (Ex op is), multi-mode
MT-4x7-**TX**-bb-cc-dd-ee-ff-gg	Copper Ethernet interface 10/100BaseTx (Ex-nA)
MT-4x7-aa-**TFT**-cc-dd-ee-ff-gg	TFT display (standard)
MT-4x7-aa-bb-**T**-dd-ee-ff-gg	Touch screen (foil)
MT-4x7-aa-bb-**TG**-dd-ee-ff-gg	Touch screen glass
MT-4x7-aa-bb-cc-**R1**-ee-ff-gg	Working memory 1 GB
MT-4x7-aa-bb-cc-**R2**-ee-ff-gg	Working memory 2 GB
MT-4x7-aa-bb-cc-dd-**4GB**-ff-gg	4 GB Solid State Drive
MT-4x7-aa-bb-cc-dd-**16GB**-ff-gg	16 GB Solid State Drive
MT-4x7-aa-bb-cc-dd-**100GB**-ff-gg	100 GB hard disk (internal)
MT-4x7-aa-bb-cc-dd-ee-**AC**-gg	Power supply 100 - 240 VAC, 50 - 60 Hz
MT-4x7-aa-bb-cc-dd-ee-**DC**-gg	Power supply 24 VDC
MT-4x7-aa-bb-cc-dd-ee-ff-**AL**	Aluminium front plate
MT-4x7-aa-bb-cc-dd-ee-ff-**VA**	Front plate stainless steel
MT-4x7-aa-bb-cc-dd-ee-ff-**RM**	Rear end module

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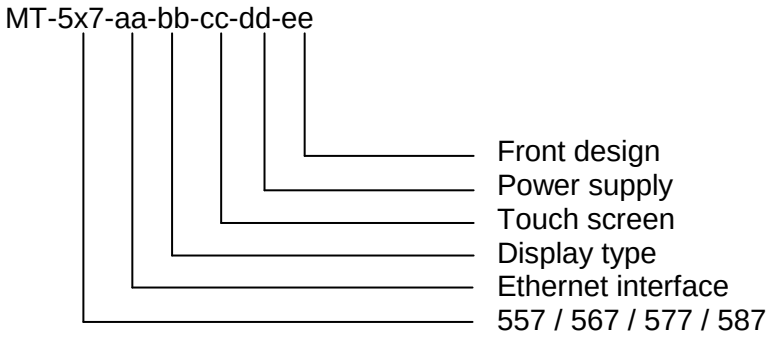
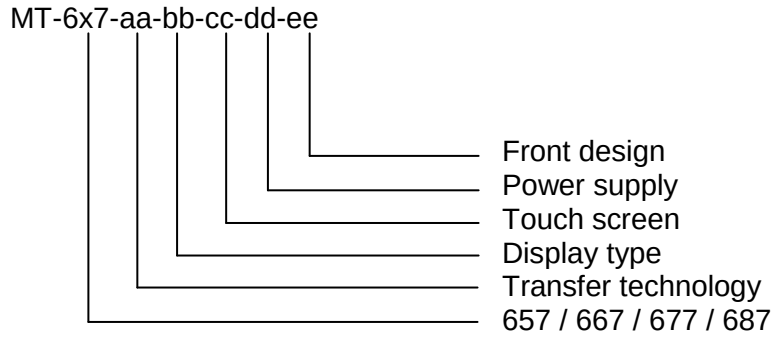
9.2 Remote HMI Thin Client MT-5x7



Product type:

Product key structure	Description
	Type with
MT-5x7-**FX-MM**-bb-cc-dd-ee	Optical fiber Ethernet interface100BaseFx (Ex op is), multi-mode
MT-5x7-**TX**-bb-cc-dd-ee	Copper Ethernet interface 10/100BaseTx (Ex-nA)
MT-5x7-aa-**TFT**-cc-dd-ee	TFT display (standard)
MT-5x7-aa-bb-**T**-dd-ee	Touch screen (foil)
MT-5x7-aa-bb-**TG**-dd-ee	Touch screen glass
MT-5x7-aa-bb-cc-**AC**-ee	Power supply 100 - 240 VAC, 50 - 60 Hz
MT-5x7-aa-bb-cc-**DC**-ee	Power supply 24 VDC
MT-5x7-aa-bb-cc-dd-**AL**	Aluminium front plate
MT-5x7-aa-bb-cc-dd-**VA**	Front plate stainless steel
MT-5x7-aa-bb-cc-dd-**RM**	Rear end module

9.3 Remote HMI KVM MT-6x7



Product type:

Product key structure	Description
	Type with
MT-6x7-**DVI1-CAT**-bb-cc-dd-ee	DVI1 KVM, with direct copper connection Gigabit (Ex-nA)
MT-6x7-**DVI1-MM**-bb-cc-dd-ee	DVI1 KVM, with direct optical fibre connection (Ex op is), multi-mode
MT-6x7-**DVI1-SM**-bb-cc-dd-ee	DVI1 KVM, with direct optical fibre connection (Ex op is), single-mode
MT-6x7-**DVI2-CAT**-bb-cc-dd-ee	DVI2 DVI, with direct copper connection Gigabit (Ex-nA)
MT-6x7-aa-**TFT**-cc-dd-ee	TFT display (standard)
MT-6x7-aa-bb-**T**-dd-ee	Touch screen (foil)
MT-6x7-aa-bb-**TG**-dd-ee	Touch screen glass
MT-6x7-aa-bb-cc-**AC**-ee	Power supply 100 - 240 VAC, 50 - 60 Hz
MT-6x7-aa-bb-cc-**DC**-ee	Power supply 24 VDC
MT-6x7-aa-bb-cc-dd-**AL**	Aluminium front plate
MT-6x7-aa-bb-cc-dd-**VA**	Front plate stainless steel
MT-6x7-aa-bb-cc-dd-**RM**	Rear end module

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10 Safety information

10.1 General Safety Information

- All relevant accident prevention regulations and the rules for electric installations have to be observed during installation, maintenace and operations. All persons involved in installation, commission, maintenance and repairs of this device and its accessories must be qualified accordingly and must have familiarised themselves with this manual and any associated documentation.
- In case of non-compliance or contravention of the above explosion-protection is no longer guaranteed and all warranty claims shall be null and void.
- National safety and accident prevention rules apply.
- Use the device for its intended purpose only.
- No changes to the device are permitted. The enclosure may only be opened by R. STAHL HMI Systems GmbH.
- The first four digits of the serial number on the type plate stand for the year of manufacture.

10.2 Installation safety information

- The national assembly and installation rules and the generally accepted technical rules must be observed. The device and its accessories must be connected and operated according to applicable standards, directives and installation guidelines. Only qualified personnel or personnel that has been instructed accordingly are allowed to install the device.
- Only appropriate tools must be used for the installation.
- The screws on the lid of the Ex-nA connection box must be fastened with a torque of 1 N.
- The cable connections of the connection box must be in line with country-specific regulations and may have to be adapted accordingly. Potential changes to the ambient parameters such as temperature must be taken into account.
- The cable entries in the connection box must have ingress protection IP 66 or may have to be adapted to meet country-specific requirements. The pre-assembled cable entry threads are size M16x1.5 and M20x1.5. The wall of the terminal box where the cable entries are mounted has a thickness of at least 4 mm.
- The cable connections must be tightened fast according to regulations. Unused cable connections must be sealed with appropriate blind plugs. Only permanently laid cables may be connected to the pre-mounted ATEX cable connections.
- The outer cable diameters must correspond to the cable connection specifications. Cable entry M16 for round cable, outer cable diameter 5...9 mm (0.2"...0.35") Cable entry M20 for round cable, outside cable cross-section 9...13 mm (0.35"...0.51").

- The device must not be opened, maintained or repaired in hazardous atmospheres (sole exception: the connection box) All circuits must be completely de-energised before the device is connected. Before opening the connection box ensure that all circuits are isolated. You must also ensure that the power supply circuit is isolated. The cable diameter must meet the terminal specifications. The connection box must be tightly sealed.
- The wire used for earthing must have a minimum cross section of 4mm² ! Make sure that there is equipotential bonding between the devices.
- We recommend you use screened cables with the device. Routing of the data cable may reduce performance. The cables used in intrinsically safe circuits must have been tested to AC 500 V / DC 750 V. If the cable properties are unknown, assume 200 pF/m and 1µH/m.
- If display types MT-xx7-DVI1-MM or MT-xx7-DVI1-SM are used, terminal X16 remains unused.
- To establish a secure earthed connection between device and plant and to prevent inadvertent loosening of the cables, each cable with its screen must be connected to the corresponding earthing bracket located in the Ex-nA connection box close to the associated terminal.
- At the place of installation voltage must not exceed 250 V and short-circuit current must not exceed 1500 A.
- A tick close to the X10 terminal indicates the voltage type (AC/DC). For the 24 VDC types the cable cross-sections depend on the cable length of the voltage supply cable, as follows:

Cable length in metres (ft)	Cable cross-section in mm² (AWG)
max. 55 m (180 ft)	1.5 mm² (AWG 16)
max. 90 m (295 ft)	2.5 mm² (AWG 14)
max. 150 m (492 ft)	4 mm² (AWG 12)
max. 225 m (738 ft)	6 mm² (AWG 10)
max. 375 m (1230 ft)	10 mm² (AWG 8)
max. 600 m (1968 ft)	16 mm² (AWG 6)

  If the cable's cross section is greater than the maximum possible for the terminals, the cable needs to be routed according to regulations via a smaller cable cross section before being inserted into the connection box (possibly using the Ex-e terminal box).

- If the intrinsically safe interfaces of an intrinsically safe device or a partially intrinsically safe device are or have been connected to a not intrinsically safe circuit, the certification ceases to apply and the device may no longer be operated as an intrinsically safe device. After the device has been operated as intrinsically safe with a low level of protection (e.g. an Ex-ia device at an Ex-ib interface), it may no longer be operated in applications for a higher level of protection (e.g. ia).

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- If the device is being used in a dust atmosphere and must be replaced, the device or the enclosure in which it is mounted must be disconnected from the mains first and then, according to regulations, be left to cool down. Before opening the device or its enclosure and whilst they are open, the environment must be kept dust-free so that no dust can intrude into the inside of the enclosure. When mounting new components please ensure that all seals are undamaged and fit tightly.
- Before starting up the device you must ensure that it has been installed according to regulations and that neither the device nor its cables are damaged.

10.3 Safety information for operation

- Operate the device only if it is clean and undamaged. If the device is in any way damaged, do not touch it to avoid injury. In the case of any damage that may compromise ingress protection (e.g. cracks, holes or broken components) the device must be taken out of commission immediately. Before the device is recommissioned the damaged components must be replaced.
- If you want to use the device in category 1D/2D/3D or EPL Da/Db/Dc, dust deposita of a thickness exceeding 5 mm must be removed and you have to ensure that no high-energy loading mechanisms at the operating surface of the unit (e.g. pneumatic particle transport) occur during operation. The device may not be used in environments where propagating brush discharges may occur.
- In general, and particularly when opening and closing enclosures, users must take care not to get injured by getting caught / trapped.
- In case of non-compliance or contravention of the above explosion-protection is no longer guaranteed and all warranty claims shall be null and void.

10.4 Special conditions

Equipotential bonding must be established for the external intrinsically safe circuits of the accessories to be connected, e.g. display, keyboard or pointer device.

11 Assembly and disassembly

11.1 General information

Assembly and disassembly are subject to general technical rules. Additional, specific safety regulations apply to electronic and pneumatic installations. In Germany, for example, these include the BG regulations (Government Safety Association) and the BetrSichVer (Betriebsicherheitsverodnung - Occupational Health and Safety).

11.2 Cut-out MT-xx7

Make a cut-out with the following dimensions:

Width	Height	Depth of cut-out	Material thickness
615 ± 0.5 mm	435 ± 0.5 mm	110 mm	up to 5 mm
24.21" ± 0.002"	17.13" ± 0.002"	4.33"	up to 0.02"

12 Operation

12.1 General information

When operating the devices, particular care shall be taken that:

- the operator interface has been properly installed according to instructions,
- the device is undamaged,
- the terminal compartment is clean,
- all screws are tightened fast,
- before switching the operator interface on, its external PE terminal is properly connected to the equipotential bonding system at its place of use,
- the cover of the terminal compartment is completely closed.

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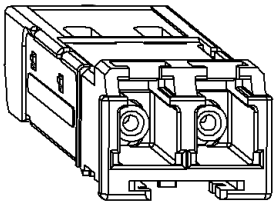
12.2 Connections

Terminal	Pin	Definition / typcial cable colour		Connection
X10	1	Power supply operator interface +24 VDC or 100 - 240 VAC		Power supply
PWR	2	Power supply operator interface 0 VDC or 100 - 240 VAC		of the operator interface
	3	Earth operator interface		Ex-nA
X11	1	+UB	Red	USB interface
KBi	2	D-	White	Ex ia
	3	D+	Green	for
	4	GND	Black	External keyboard
X12	1	+UB	Red	USB interface
Mi	2	D-	White	Ex ia
	3	D+	Green	for
	4	GND	Black	Mouse
X13	1	+UB	Red	USB Ex-nA
	2	D-	White	
	3	D+	Green	
	4	GND	Black	
X14	1	+12 V	Red	12 VDC Output
	2	GND	Black	Ex-nA
X16	1	TRD0+	White / Orange	Ethernet copper
CAT7 1	2	TRD0-	Orange	connection *
Data	3	TRD1+	White / Green	Ex-nA
	4	TRD1-	Green	
	5	TRD2+	Blue / White	
	6	TRD2-	blue	
	7	TRD3+	White / Brown	
	8	TRD3-	Brown	
	9	SHLD	Screen	
X18 FO 1 Data		 Tx Rx	optical fibre connection type LC Duplex connector	Ethernet optical fibre interface * Ex op is
X24	1	+UB	Red	USB interface
USB1i	2	D-	White	Ex ia
	3	D+	Green	
	4	GND	Black	
X25	1	+UB	Red	USB interface **
USB2i	2	D-	White	Ex ia
	3	D+	Green	
	4	GND	Black	
X97	1	TxD	Blue / White	Serial
SER	2	RxD	blue	Ex-nA interface
	3	RTS	White / Orange	RS-232
	4	CTS	Orange	
	5	GND	Black	

X101	1	FBAS	White	Video
CAM	2	GND	Black	Ex-nA interface
X105	1	CH1 / line out left	Red	Audio
AUD	2	CH2 / line out right	Black	Ex-nA interface
	3	CH3 / line in left	Red	
	4	CH4 / line in right	Black	
	5	GND	Black	

☞ The following applies to all terminals:
0.2 - 2.5 mm² / 24 AWG - 16 AWG for flexible cable
0.2 - 4 mm² / 24 AWG - 14 AWG for rigid cable
Strip cable of 7 mm (0.28 in) insulation
max. one cable per terminal

☞ recommended cable length for terminals X11, X12, X13, X14, X24, X25:
max. 3 m (10 ft)

☞ * Please note that the Ethernet connection is **either** for an optical fibre connection (X16) **or** for a copper connection (X18), depending on the version ordered !
If display types MT-xx7-DVI1-MM or MT-xx7-DVI1-SM (optical fibre versions) are used, terminal X16 remains unused.
In the case of an optical fibre connection the following cable is recommended:

Multi-mode optical fibre cable	50 µm core cross section and 125 µm external cross section
Single-mode optical fibre cable	9 µm core cross section and 125 µm external cross section

☞ ** The USBi2 connection (X25) is **NOT** available for devices with touch screen and may **NOT** be connected.

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13 Maintenance

Because the transmission of the devices remains reliable and stable over long periods of time, regular adjustments are not required.

Keep the units clean so that the enclosure locks and screws remain accessible. Maintenance may be required for the enclosure seal.

System maintenance should focus on the following:

a. Seal wear
b. Display damage
c. All screws are tightened fast
d. All cables and lines are properly connected and undamaged

14 Troubleshooting

Devices operated in hazardous areas must not be modified. Repairs may only be carried out by qualified, authorized staff specially trained for this purpose.

☞ Repairs may only be carried out by specially trained staff who are familiar with all basic conditions of the applicable user regulations and – if requested – have been authorized by the manufacturer.

14.1 Repairs / hazardous substances

An error description must be enclosed with any units returned to R. STAHL HMI Systems GmbH for repairs.

Remove all material residues. Please pay particular attention to the seal grooves and slits where material residues may be lodged. We have to ask you not to return a unit if you are unable to completely remove any hazardous substances. We shall bill you for any costs arising from insufficiently cleaned units, such as disposal or damage to persons (chemical burns, etc.).

15 Disposal

Disposal of packaging and used parts is subject to regulations valid in whichever country the device has been installed.
The disposal of devices sold after August 13th, 2005, and installed in countries under the jurisdiction of the EU is governed by directive 2002/96/EC on waste electrical and electronic equipment (WEEE). Under this directive, operator interfaces are listed in category 9 (monitoring and control instruments).

We shall take back our devices according to our General Terms and Conditions.

15.1.1 ROHS directive 2002/95/EC

The prohibition of hazardous substances as detailed in directive 2002/95/EC (ROHS) does not apply to electronic equipment of categories 8 and 9, and is therefore not applicable to the equipment described in these operating instructions.

16 Trademarks

Any trademarks used and depicted in the text are the property of their respective owners and are recognised as protected.

17 Front panel resistance

This section contains information on the resistance of the operator interfaces to various environmental factors. These have an impact on the mechanical, thermal and chemical stability of the operator interfaces.

The resistance to chemicals was tested according to DIN 42115 Part 2, i.e. the stability over 24 hours without visible changes to the operator interfaces.

17.1 Materials

Application	Material
Front plate	Aluminum
Touch screen	Polyester
Enclosure	Stainless steel
Front panel seal	Polyurethane

17.1.1 Material properties

☞ The selection of chemicals listed here is not exhaustive.
☞ More comprehensive lists can be obtained for further information from R.-STAHL HMI Systems GmbH.
☞ Because of the numerous chemical substances available on the market, these lists can only represent a selection.

17.1.2 Touch membrane (polyester)

Property	Chemical material class / group	Chemical substances	Test method
Chemical • Chemical resistance	Alcohols	1,3 Butanediol 1,4 Butanediol Cyclohexanol Diacetone alcohol Ethanol Glycol Glycerol Isopropyl alcohol Methanol Neopentyl glycol Octanol 1,2 Propylene glycol Triacetin Dowandol DRM/PM	DIN 42115 DIN 53 461 or ASTM-F-1598-95
	Aldehydes	Acetaldehyde Formaldehyde 37-42%	
	Amines	Ammonia <2%	
	Esters	Amyl acetate Ethylacetate N-Butyl acetate	

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Ethers	1.1.1. Trichloroethane Ether Dioxane Diethyl ether 2-Methyltetrahydrofuran (2-ME-THF)
Aromatic hydrocarbons	Benzene Toluene Xylene Paint thinner (white spirit)
Ketones	Acetone Methyl ethyl ketone Cyclohexanone Methyl isobutyl ketone (MIBK) Isophorone
Diluted acids	Formic acid <50% Acetic acid <5% Phosphoric acid <30% Hydrochloric acid <10% Nitric acid <10% Trichloroacetic acid <50% Sulfuric acid <30%
Diluted alkaloids (bases)	Caustic soda <40%
Household chemicals	Ajax Ariel Domestos Downey Fantastic Formula 409 Gumption Jet Dry Lenor Persil Tensides Top Jop Vim Vortex Washing powder Fabric conditioner Whis Windex
Oils	Petrol Drilling muds Braking fluid Decon foam Diesel oil Varnish Keroflux Paraffin oil Castor oil Silicone oil Solvent naphta Mineral turpentine Kerosene

	No specific material class	Acetonitrile Alkali carbonate Dichromates Potassium dichromate Caustic soda <20% Dibutyl phthalate Dioctyl phthalate Iron II chloride ($FeCl_2$) Iron II chloride ($FeCl_3$) Haloalkanes Potassium soap Potassium hydroxide <30% Sodium bisulfate Tetrachloroethylene Salt water Trichloroethylene Water Hydrogen peroxide >25%	
Property	**Resistance**		**Test method**
Mechanic (keyboard) • durability • Action power • MIT folding resistance	>1 million actions max. 50 N >20000 folding operations		Autotype method ASTM D2176
Mechanic (touch screen) • point activation	1 million activations at any single point		3M method
Thermal • Dimensional • Dimension stability	Max. 0.2% at 120° longitudinal Typically 0.1%		Autotype method

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18 Declaration of EC conformity

EG-Konformitätserklärung
EC-Declaration of Conformity
Déclaration de Conformité CE

R. STAHL HMI Systems GmbH • Im Gewerbegebiet Pesch 14 • 50767 Köln, Germany
erklärt in alleiniger Verantwortung, *declares in its sole responsibility, déclare sous sa seule responsabilité,*

dass das Produkt *that the product* *que le produit*	**MT-##7**
Typ, *type, type:*	**Display Unit MT-##7*-CAT7*** **Display Unit MT-##7*-MM*** **Display Unit MT-##7*-SM*** *=any alphanumeric or symbolic character, without relevance for explosion protection #=one numeric character, without relevance for explosion protection
Kennzeichnung, *marking, marquage:*	**For Display Unit:** **II 3(1) G Ex nA nR [ia op is Ga] IIC T4 Gc** **II 3(1) D Ex tc IIIC [ia op is Da] IP66 T110°C Dc**
mit der EG-Baumusterprüfbescheinigung, ***ausgestellt durch Benannte Stelle:*** *under EC-Type Examination Certificate,* *issued by notified body:* *avec Attestation d'examen CE de type,* *exposé par organisme notifié:*	**BVS 12 ATEX E 033 X** **DEKRA EXAM GmbH** Dinnendahlstraße 9 44809 Bochum

auf das sich diese Erklärung bezieht, mit den folgenden Normen oder normativen Dokumenten übereinstimmt
which is the subject of this declaration, is in conformity with the following standards or normative documents
auquel cette déclaration se rapporte, est conforme aux normes ou aux documents normatifs suivants

Bestimmungen der Richtlinie *Terms of the directive* *Prescription de la directive*	Nummer sowie Ausgabedatum der Norm *Number and date of issue of the standard* *Numéro ainsi que date d'émission de la norme*
94/9/EG: **ATEX-Richtlinie** *94/9/EC: ATEX Directive* *94/9/CE: Directive ATEX*	EN 60079-0: 2009 EN 60079-11: 2007 EN 60079-15: 2010 EN 60079-28: 2007 EN 60079-31: 2009 EN 61241-11: 2006
2004/108/EG: **EMV-Richtlinie** *2004/108/EC: EMC Directive* *2004/108/CE: Directive CEM*	EN 61000-6-2: 2006 EN 61000-6-4: 2007
2006/95/EG: **Niederspannungsrichtlinie** *2006/95/EC: Low Voltage Directive* *2006/95/CE: Directive Basse Tension*	EN 50178: 1997 EN 61010-1: 2001+ Corrigendum / Errata

Köln, 04.04.2012

Ort und Datum
Place and date
Lieu et date

J. Düren
Technical Director

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Quality Manager

Datei: CE_MT-xx7_20120404.docx

Vorlage: F058_EG-Konferklärung-HMI_20110325.docx

19 Release notes

The chapter entitled "Release Notes" contains all the changes made in every version of the operating instructions.

Version 1.01.00

- Original version of the operating instructions

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